Department of Environmental Protection
Bureau of Land & Water Quality June, 2002

O&M Newsletter

A monthly newsletter for wastewater discharge licensees, treatment facility operators and associated persons

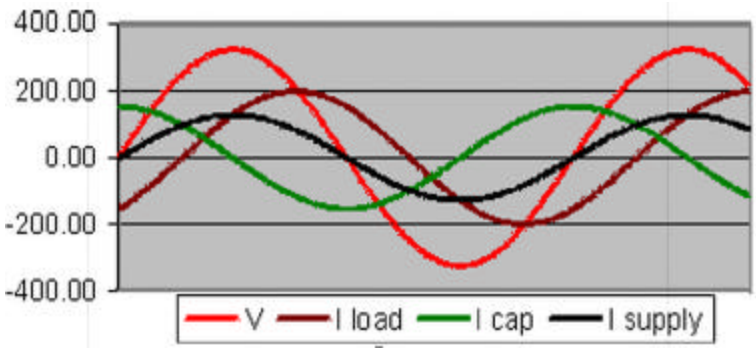
Energy Conservation in Wastewater Treatment Facilities

The next in our series of articles on Energy Conservation discussed the principle of Load Factor and how you can balance the load factor in you facility to save energy and money. This article is reprinted from a report titled "Saving Money and the Environment Through Energy Savings". The report was the result of a joint effort between staff from the Region 1 EPA Office in Boston, several of the New England States, several New England Utilities, several consultants and vendors in doing business in the energy field and the New England Interstate Water Pollution Control Commission.

Power Factor Correction

As with any equipment, an electrical system handles its job to some degree of efficiency ranging from poor to excellent. This measure of electrical efficiency is known as the Power Factor. Under ideal conditions the power factor would be 100%. However, motors and other inductive equipment (transformers, light ballasts) require energy that does no work and as a consequence, the power factor decreases.

Low power factor causes heavier currents to flow in distribution lines in order to provide needed kilowatts to the end user. Because the utility company must invest in oversized equipment to provide increased power to serve low power factor loads, a charge is commonly assessed on a facility's electric bill to recover the equipment costs and lost energy caused by low power factor. The



direct cost of a low power factor usually shows up on the monthly bill as an extra charge. The assessed charges are not always readily obvious by looking at your bill. Some of the more common names for the charges are power factor penalty, pf adjustments, or kVA demand, to name a few. Analyzing your utility bills will usually reveal if you have a power factor problem. Even if the utility does not bill directly for power factor, a low power factor can raise your kWh and demand billing. All utility companies can supply you with a rate schedule that explains their charges including power factor.

Many facilities can improve their power factor by ensuring their motors are not oversized and by installing power factor correction capacitors. However, the cost effectiveness of improving power factor depends on such variables as utility power factor penalties, the facility's need for

additional electrical system capacity, and energy costs. The following example will give you an idea of the penalty for having a low power factor.

> A facility has an average monthly demand of 1200 kW and a power factor of 0.78.
> The utility charges according to kW demand (say $4.50/kW) and has a surcharge for power factors less than 0.95. The following formula shows a billing adjustment based upon a power factor less than 0.95.
>
> kW (billed) = kW demand x demand rate x 0.95/PF
>
> Monthly Utility bill with present power factor of 0.78:
>
> kW (billed) = 1200 kW x $4.50 x 0.95/0.78 = $6579
>
> Monthly Utility bill after power factor corrected to 0.95:
>
> kW (billed) = 1200 kW x $4.50 x 0.95/0.95 = $5400
>
> Annual Savings=($6579 - $5400) x 12 months=$14,148

In this example, if the organization supports cost saving projects with a payback of 3 years or less, then power factor correction equipment costing less than $42,000 would make this project acceptable, and profitable.

As you can see, to assess the benefits of installing equipment to correct your power factor it is critical to understand your electric bill and the utility's rate structure. Your utility can provide you with printed rate schedules that describe the various rates available and illustrate how charges are calculated.

Electronic Copies of the O&M news

This is the last notice we'll publish for a while reminding you to sign up to get the O&M News via e-mail. You can find it on the DEP Web site at http://www.state.me.us/dep/blwq/newslet/omnews.pdf , but e-mail is a quicker way to get the news in your hands. (And we promise not to throw it in the bushes.)

If you have e-mail and would like to receive the O&M News electronically instead of in the mail, please send an e-mail to:

dick.darling@state.me.us

We will add your e-mail address to our e-mail group and start sending your O&M News electronically.

Spring 2002 Exam

Results from the Spring exam should be back from ABC by the end of June. We'll let everyone know as soon as we get the results, so please be patient.

Dick Darling

UPCOMING TRAINING COURSES

June 13, 2002 in Veazie, ME – 6th Annual Lagoon Day - sponsored by MRWA, (207) 729-6569 - Approved for 6 hours.
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August 13, 2002 in Portland, ME – Security and Emergency Preparedness Workshop for Wastewater Facilities – Sponsored by EPA/NEIWPCC/NEWEA, (978) 322-7929 – Approved for 6 hours.
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September 25, 2002 in Portland, ME – Security and Emergency Preparedness Workshop for Wastewater Facilities – Sponsored by EPA/NEIWPCC/NEWEA, (978) 322-7929 – Approved for 6 hours.

2002 Operator Certification Renewals

Renewal letters and pocket cards have been sent to all operators who submitted renewal forms and whose training has been verified. Some operators who did not meet the 18-hour training requirement by March 1 will not receive their renewal notice until we can verify that their training has been completed.

Any operators who did not submitted their renewal forms have been placed on inactive status. They will be required to submit a reactivation form and $30.00 reactivation fee before March 1, 2004 to reinstate their license.
Anyone whose license has been inactive for more than two years as of March 1, 2002 has been dropped from our lists and will be required to reapply and pass the exam in order to regain their license.

Dick Darling

For Practice

1. Primary Clarifiers remove:
   a. dissolved solids
   b. inorganic solids
   c. settleable solids
   d. total solids

2. You get a sudden increase of organic material to your treatment plant. What steps should you take to make sure that adequate treatment is maintained?
   a. Chlorinate the return sludge and the influent
   b. Decrease the aeration and waste more sludge.
   c. Increase the return rate and add supernatant.
   d. Increase the aeration and increase the return rate.

3. In a series circuit, if one unit is burned out or disconnected, the other units will,
   a. become overloaded
   b. cease to function
   c. continue to function
   d. continue to function until the failed unit is replaced.

4. One type of positive displacement pump is:
   a. a peristaltic pump.
   b. a radial flow pump.
   c. an air lift pump
   d. an axial flow pump

Criminal Enforcement Actions

Generally speaking, environmental crimes result from a conscious decision by someone to ignore the laws and regulations. These illegal acts are not innocent mistakes, inadvertent errors or insignificant accidents. Unlike civil penalties, criminal violations entail potential imprisonment. In addition to potential prison terms, monetary penalties may also be imposed for criminal violations of environmental laws. Defendants can be ordered to pay either a fine or restitution for their criminal acts.

The statutory authority that exists for the Maine Department of Environmental Protection (MDEP) to initiate a criminal enforcement action is found in Title 38, Section 349, of Maine Law. Any person who intentionally, knowingly, recklessly or with criminal negligence violates any

provision of the laws administered by the Department is guilty of a Class E crime and may be punished accordingly. The fine for such a violation ranges from $2,500 to $25,000 for each day of the violation. The exception is for a knowing violation – in this case the minimum fine is $5,000 for each day of the violation.

With regard to falsification and tampering, Title 38, Section 349, maintains that any person who knowingly makes any false statement, representation or certification in any application, record, report, plan or other document filed or required to be maintained by the Department, or who tampers with or renders inaccurate any monitoring devices or method required by any provision of law or any order rule, license, permit, approval or decision, is upon conviction, subject to a fine of not more than $10,000, or by imprisonment for not more than 6 months, or both.

The definitions for culpable states of mind, including intentionally, knowingly and recklessly, are found in Title 17-A, Maine's Criminal Code:

- Intentionally - A person acts intentionally with respect to a result of his conduct when it is his conscious object to cause such a result. A person acts intentionally with respect to attendant circumstances when he is aware of the existence of such circumstances or believes that they exist.

- Knowingly - A person acts knowingly with respect to a result of his conduct when he is aware that it is practically certain that his conduct will cause such a result. A person acts knowingly with respect to attendant circumstances when he is aware that such circumstances exist.

- Recklessly - A person acts recklessly with respect to a result of his conduct when he consciously disregards a risk that his conduct will cause such a result. A person acts recklessly with respect to attendant circumstances when he consciously disregards a risk that such circumstances exist.

On March 20, 2001, a wastewater treatment plant operator was convicted of criminal falsification of an environmental report in Maine District Court. One of the conditions of the one-year probation term was to not accept employment in wastewater treatment, or to handle environmental data for use by the State of Maine. The operator's sewerage treatment certificate, issued by the Department, was revoked in a separate Administrative Court action in February 2001.

In addition, a number of the federal environmental statutes enforceable by the United States Department of Justice provide that certain egregious environmental violations constitute felonies. A person guilty of a criminal violation of an environmental protection law may also have committed other misdemeanor or felony acts, such as fraud or creating a public nuisance, as described in the criminal code.

In a February 2000 California case, a sewer plant operator pleaded guilty to violating the Clean Water Act. The defendant admitted that he instructed his staff to allow wastewater to bypass a chlorine contact chamber, that he failed to report an overflow of sewage into San Pablo Bay and that he ordered plant operators to tamper with a monitoring test. The release of

partially treated or untreated wastewater into surface waters presents a risk of infections to people and can harm aquatic organisms and wildlife. The plea agreement called for the operator to serve a 10 month prison term and one year of supervised release. The case was investigated by EPA's Criminal Investigation Division and was prosecuted by the U.S. Attorney's Office in Oakland, California.

Three employees of Johnson Properties Inc., which manages wastewater treatment facilities in Central Louisiana, pleaded guilty on Feb. 4, 2000, in U.S. District Court in New Orleans, La. The General Manager Glenn K. Johnson admitted to conspiring to violate the Clean Water Act (CWA) and to obstruction of justice for bribery and submitting false discharge monitoring reports. As part of his plea agreement, Johnson will spend three years in federal prison and will pay $500,000 in fines plus $250,000 restitution to homeowners who were serviced by wastewater treatment plants operated by Johnson Utilities. President Montell Watkins pleaded guilty to conspiring to violate the CWA and faces up to five years in prison and/or a $250,000 fine. Water Laboratory Director Carol Rowell admitted to negligently violating the CWA by submitting reports to regulators without checking their accuracy; she faces up to one year in prison and/or a fine of $100,000. The case was investigated by EPA's Criminal Investigation Division, the U.S. Department of Transportation's Office of Inspector General, the FBI, the U.S. Postal Inspection Service, the U.S. Coast Guard Investigative Service, and the Louisiana Department of Environmental Quality.

Other criminal environmental cases can be found at:

http://www.ehso.com/Pollutors.htm

You can easily access Maine Laws at the following webpage:

http://janus.state.me.us/legis/statutes/

Carolyn Bergeron

Answers to *For Practice:*

1. c Primary Clarifiers remove insoluble materials that settle easily from raw wastewater
2. d A sudden increase in organic matter will increase the Food to Microorganism (F:M) ratio. Increasing the return rate will bring sludge from the clarifiers back to the aeration tanks and bring the F:M ratio back down. The respiration rate will increase, requiring more aeration
3. b A series circuit has all the units arranged one after the other. If one units burns out, causing a break in the circuit, all the units will stop functioning.
4. a A positive displacement pump moves fluids by physically displacing them by changing the volume of the cavity containing the fluid. A peristaltic usually uses a series of wheels to squeeze tubing causing the fluid to be moved.